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Performance of Calves Fed Chlortetracycline-Sulfamethazine
During Feedlot Adaptation Followed by Chlortetracycline

P. J. Thiex, L. B. Embry and J. E. Olson

Weight gains of calves have shown improvement from chlortetracycline supplementation at 350 mg. per head daily for periods of 3 to 4 weeks following weaning and shipping. Later response to a lower level of the antibiotic (70 mg. daily) is generally at a higher level and more consistent when preceded by the initial high level. More recent research has shown that a combination of chlortetracycline and sulfamethazine, each at 350 mg. daily, often affords greater and more consistent benefits with calves than does chlortetracycline alone during the initial 3 to 4 weeks in the feedlot.

This experiment was conducted to determine the effects of supplementing calves with a chlortetracycline-sulfamethazine combination for 4 weeks following weaning. Chlortetracycline was then fed at 70 mg. daily during a growing phase when the calves were fed a high-roughage diet.

Procedures

Bull (64 head) and heifer (102 head) calves from the cow herd at the Pasture Research Center, Norbeck, were used in the experiment. The calves were from Hereford cows where an A.I. program, using semen from one Hereford bull, was used for about 6 weeks. Yearling Hereford bulls which were half-sibs or from half-sib sires were then turned with the cows with one bull to each experimental pasture of 8 to 10 cows.

After the calves had been weaned and offered access to hay and water for about 1 week, the bulls were trucked to Brookings, a distance of about 180 miles. They were allotted to 8 pens of 8 each on basis of weight. Four pens were fed 2 lb. daily of a 32% protein supplement. The other four pens were fed the supplement with chlortetracycline-sulfamethazine combination added to furnish 350 mg. of each drug per head daily. The bulls were fed 3 lb. whole oats and a full feed of alfalfa-brome haylage in addition to the protein supplement.

After 4 weeks, the chlortetracycline-sulfamethazine treatment was discontinued and chlortetracycline at 70 mg. daily substituted. Otherwise, feeds remained the same. This growing phase was terminated after an additional 70 days beyond the 4-week feedlot adaptation period.

The bull calves were fed twice daily in paved outside pens without access to shelter during both phases of the experiment. Feeding was once daily. The calves were observed at frequent intervals during the first 4 weeks of the experiment for signs of sickness. Individual medication was given to those having a temperature of 104° F. or more.

The heifers were fed at the station where raised. They were allotted into two pens of 51 head each. The pens were not paved, and the calves had access to

shelter. Feeding and management procedures were similar as for the bulls except alfalfa hay was fed instead of haylage.

Upon termination of the feedlot adaptation phase of the experiment for the heifers, chlortetracycline at 70 mg. daily was substituted for the chlortetracycline-sulfamethazine combination. They remained at the Pasture Research Center for an additional 81 days. They were then trucked to Brookings and fed for another 72 days in a manner similar to the bulls.

Results

Feedlot Adaptation

Results of the feedlot adaptation phase of the experiment are shown in table 1. The design of the experiment was not intended to be a comparison between bulls and heifers.

Bull calves fed the chlortetracycline-sulfamethazine combination in the protein supplement gained 2.13 lb. daily in comparison to 1.67 for the control group, a difference of 0.46 lb. daily. They consumed more feed (1.9 lb. as haylage) but had lower feed requirements.

Four bulls required individual medication during this 4-week period. Two were from the control group and two from the treated group.

Treated heifers gained 1.39 lb. daily, 0.63 lb. more than for the control group. Feed intake was only slightly greater than for the control group but with a considerable improvement in feed efficiency. One heifer from the treated group died during the third week of the experiment. Otherwise, there were only minor health problems encountered.

Growing Phase

Results for this phase of the experiment are presented in table 2. Rate of gain and feed efficiency varied only slightly between control and the antibiotic-supplemented bulls during the 70 days of this phase of the experiment. However, the slightly higher rate of gain made by the control bulls during this period resulted in total gain for the feedlot adaptation and growing periods being nearly the same.

Only the 72-day growing phase of the experiment following shipping of the heifers to Brookings is presented in table 2. They received the control and chlortetracycline supplements according to the experimental design during the 81 days from termination of the feedlot adaptation phase until shipped. However, this period is omitted from the experiment because of problems encountered with the scale for weighing the animals and in weighing the feeds.

During the 72-day growing phase, weight gains favored the control group by a small amount. Feed requirements were about the same for the control and those fed chlortetracycline. Total gain for the feedlot adaptation and growing periods were about the same as in the case of the bull calves.

Summary

Bull calves shipped and heifer calves not shipped following weaning showed a marked response in weight gains to chlortetracycline-sulfamethazine (350 mg.

of each drug daily). The increase in gain for a 29-day feedlot adaptation period amounted to 0.46 lb. daily (1.67 vs. 2.13 lb.) for treated bulls and 0.63 lb. daily (0.76 vs. 1.39 lb.) for treated heifers. There appeared to be no difference in incidence of disease encountered during this period between control and treated bulls or heifers.

During a subsequent growing phase of 70 days for bulls and 72 days for heifers, weight gains were slightly in favor of control groups. This resulted in total gains for both periods being about the same. However, the higher gains for the calves supplemented with chlortetracycline-sulfamethazine during the initial 29-day period would indicate healthier calves during this time.

Table 1. Feedlot Adaption of Calves Fed Chlortetracycline-Sulfamethazine (Adaptation Phase)

| | Bulls (29 days) | | Heifers (29 days) | |
|-------------------------|-----------------|-----------------------------------|-------------------|-----------------------------------|
| | Control | CTC sulfa- methazine 700 | Control | CTC sulfa- methazine 700 |
| Number in lot | 32 | 32 | 50 | 49 |
| Init. shrunk wt., lb. | 338 | 334 | 366 | 352 |
| Final shrunk wt., lb. | 387 | 396 | 388 | 390 |
| Avg. daily gain, lb. | 1.67 | 2.13 | 0.76 | 1.39 |
| Avg. daily feed, lb. | | | | |
| Alfalfa-brome (haylage) | 8.9 | 10.8 | (hay) 6.1 | 6.5 |
| Oats | 2.9 | 2.9 | 2.9 | 2.9 |
| Supplement | 1.9 | 1.9 | 1.9 | 1.9 |
| Total | 13.7 | 15.6 | 10.9 | 11.3 |
| Feed/100 lb. gain, lb. | | | | |
| Alfalfa-brome (haylage) | 534 | 499 | (hay) 587 | 470 |
| Oats | 174 | 136 | 513 | 208 |
| Supplement | 116 | 90 | 308 | 159 |
| Total | 824 | 725 | 1408 | 829 |

Table 2. Feedlot Growing of Calves Fed Chlortetracycline
(Growing Phase)

| | Bulls (70 days) | | Heifers (72 days) | |
|------------------------|-----------------|------|-------------------|------|
| | Control | CTC | Control | CTC |
| Number in lot | 30 | 32 | 47 | 49 |
| Init. shrunk wt., lb. | 391 | 396 | 461 | 461 |
| Final shrunk wt., lb. | 493 | 494 | 561 | 556 |
| Avg. daily gain, lb. | 1.48 | 1.42 | 1.39 | 1.32 |
| Avg. daily feed, lb. | | | | |
| Alfalfa-brome haylage | 15.6 | 15.7 | 15.6 | 14.6 |
| Oats | 3.0 | 3.0 | 3.4 | 3.3 |
| Supplement | 1.0 | 1.0 | 2.0 | 2.0 |
| Total | 19.6 | 19.7 | 21.0 | 19.9 |
| Feed/100 lb. gain, lb. | | | | |
| Alfalfa-brome haylage | 1052 | 1110 | 1123 | 1095 |
| Oats | 203 | 209 | 242 | 246 |
| Supplement | 67 | 70 | 146 | 148 |
| Total | 1322 | 1389 | 1511 | 1489 |